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ABSTRACT

This study examined whether varying intensity of emotions can be employed in conjunction with multiple emotion responses and valence of emotion to describe a scalable developmental sequence for young children. Eighty children between the ages of 4 and 8 years were interviewed individually. A version of the Emotions Situations Questionnaire was used, asking children to self-predict the occurrence of 5 emotions (happy, loving, sad, angry, and scared) on a 5-point scale of intensity to each of 15 affect-laden situations. A concrete, visual apparatus depicting the five emotions was constructed to reduce dependency on verbal responses. Findings indicated that the use of multiple emotions, varying intensity of emotions, and valence of emotions emerge in an orderly, developmental sequence. Children around age 4 could predict experiencing multiple emotions of the same intensity and same valence to affect-eliciting situations. Children around age 6 predicted experiencing multiple emotions of varying intensity but the same valence. Children around age 8 predicted multiple emotions of varying intensity and opposite valence. The number of emotions reported by 8-year-old children was greater than that reported by younger children. Accuracy of identifying targeted emotions increased with developmental level. The stages of development were consistent with a Piagetian and Neo-Piagetian cognitive-developmental framework. (MM)

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A Developmental Sequence in the Comprehension of Emotions: Multiple Emotions, Intensity, and Valence

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ABSTRACT

Children, aged 4 to 8 years, were asked to self-predict the occurrence of 5 emotions (happy, loving, sad, angry, scared) on a 5-point scale of intensity to each of 15 affect-laden situations. Findings indicate that the use of multiple emotions, varying intensity of emotions, and valence of emotions, emerge in an orderly, developmental sequence. Level B children (around age 4) could predict experiencing multiple emotions of the same intensity and same valence to affect-eliciting situations. Level C children (around age 6) predicted experiencing multiple emotions of varying intensity but the same valence. Level D children (around age 8) predicted multiple emotions of varying intensity and opposite valence. In addition, the number of emotions children predicted experiencing at one time occurred at younger ages than previously reported. Finally, accuracy of identifying targeted emotions increased with developmental level. The stages of development are consistent with a Piagetian and Neo-Piagetian cognitive-developmental framework.

INTRODUCTION

In the 1980's the field of developmental psychology renewed interest in attempting to understand children's emotional development. Some researchers have concentrated on children's simultaneous understanding of more than one emotion (Harter & Buddin, 1986) whereas others have addressed multiple emotion responses allowing for close temporal proximity (Russell & Ridgeway, 1983; Wintre, Polivy & Murray, 1990). Varying intensity of emotions, in contrast, was less emphasized as an aspect of emotional development. It is proposed here that intensity is a relevant and elementary aspect of emotion. Not only is the intensity of emotion referred to in everyday life, but it represents a salient dimension which characterizes pathological mood disorders.

The present study examines the possibility that varying intensity of emotions is an elementary aspect of emotional development that can be employed in conjunction with multiple emotion responses and valence of emotion to describe a scalable developmental sequence for young children. In addition, accuracy of identifying targeted emotions, defined by adults, is examined from a developmental sequence.

METHOD

Subjects

A total of 80 children between 4 and 8 years of age were interviewed. There were 8 females and 8 males in each of the five age groups. The average age of each group of children was as follows: 4 yrs 6 mos; 5 yrs 5 mos; 6 yrs 6 mos; 7 yrs 6 mos; 8 yrs 6 mos. Children were recruited from two public daycares and two junior public schools. The majority of subjects were from middle class and English speaking backgrounds. Although primarily Caucasian, a number of children were Oriental and a number were Black.

Questionnaire

A version of the Emotions Situations Questionnaire, developed by Schwartz and Weinberger (1980) and modified by Wintre et al. (1990) was used. Where necessary, some sentences were added and changed in order to make the content appropriate for children as young as 4 years of age. Three situational sentences were used which targeted each of the five emotions, resulting in a total of 15 situational sentences. The situations were designed to elicit specific targeted emotions but not pure emotions. This left open the possibility of multiple emotional responses. The situational sentences were presented in a random order which was fixed across subjects.

Apparatus

A concrete, visual apparatus was constructed in order to reduce dependency on verbal responses and thereby elicit optimal responses from the youngest children. The apparatus consisted of a wooden, square frame. Along the left hand side of the frame, from top to bottom, were five circular, line drawings of colourful faces with variations in expression, depicting the five emotions. These facial expressions were readily

identified by the children. Along the top of the apparatus, from left to right, were drawings of five thermometers exhibiting increasing levels. Wooden rods extended horizontally from each facial expression. On each rod was a coloured bead which matched the colour of the face on the left hand side of the frame. The beads could be moved from left to right along the rod, which allowed the child to respond to the intensity component of the task. The intensity measure consisted of a 5-point Likert scale consisting of the continuum: 'not at all, a little, sort of, very much, very very much'.

Questionnaire Items

ANGRY:

1. Someone is trying to make you do something you don't want to do, like clean your room.
2. Someone calls you bad names.
3. You don't get your turn to win a prize.

HAPPY

1. You have a terrific time at a party.
2. Your mother is crying, you give her a hug and she stops crying.
3. For your birthday you get a brand new bicycle.

SAD

1. Your best friend moves away.
2. Your pet dies.
3. All your friends have gone out to play but you cannot because you are sick.

SCARED

1. You lose control of your bike and almost crash.
2. You have a nightmare.
3. You are home all alone.

LOVING

1. You see a friend's baby kittens playing in the yard.
2. Someone special brings their new baby for you to see.
3. You see a mother hug her child.

Procedure

Children were interviewed individually using a semi-structured format. The experimenter sat beside the child and the wood frame was situated in front of them. The experimenter introduced the task to each child in the following manner: "I am going to tell you some little stories. I want you to listen carefully to them because when I am finished, I am going to ask you how you would feel if you were in the story." At this point the experimenter introduced the practice situation. Pre-training was done with the scale to ensure the children understood how to use it properly.

Hypotheses

A developmental sequence of four progressively complex stages was predicted which would integrate the elements of multiple emotions, intensity and valence.

LEVEL A: only one emotion, varying intensity, no valence

LEVEL B: multiple emotions, same intensity, same valence

LEVEL C: multiple emotions, varying intensity within a situation, same valence

LEVEL D: multiple emotions, varying intensity within a situation, different valence.

ACCURACY: Accuracy of identifying targeted emotions would increase with age and/or developmental level

RESULTS

Developmental Progression

The hypotheses predicted that when the elements of multiple emotions, intensity, and valence were integrated, there would be a developmental sequence of four progressively complex stages.

Children's most sophisticated responses were used to categorize their developmental level. Therefore, for assignment to a given level the child had to respond to at least one of the emotion-eliciting situations with a pattern that included all of the criteria for a particular level.

The findings, presented in Table 1, are represented in a Guttman Scale. This scalogram method determines whether a set of items forms a unidimensional scale. The data indicate that although there were no subjects at Level A, the upper three levels were represented in an orderly developmental progression.

In order to investigate if the three hypothesized levels occurred in the predicted developmental sequence, a one-way ANOVA was conducted with level (B, C, D) as the independent variable and age (in months) as the dependent variable. The results showed a main effect for level $F(2,79) = 56.25$, $p = .0003$. Scheffe tests ($p < .05$) indicated that the mean age of Level B (59 months) was significantly different from the mean age of Level C (78 months) and Level D (93 months). As well, Level C and Level D were also significantly different from each other. The results indicate that the ages of the children increase with each successive level.

Number of Emotions

In order to investigate if number of emotions predicted differed according to age, an ANOVA was performed with age (4, 5, 6, 7, 8 years) as the independent factor and number of emotions (2, 3, 4) as the dependent variable. A main effect for age was found $F(4,79) = 9.86$, $p < .0001$. Scheffe tests ($p < .05$) indicated a difference in the ages at which children reported experiencing different numbers of co-occurring emotions. The average number of emotions reported by the 8-year-old children (3.3 emotions) was significantly greater than the average number of emotions reported by the younger children (2.3).

Accuracy

For the response to be recorded as accurate, the targeted emotion had to be cited as the most intense or one of the most intense emotions for the situation. A three-way repeated measures ANOVA with emotion (happy, sad, angry, loving, scared) as the within-subjects variable and level (B, C, D) and sex (M, F) as the between-subjects variables revealed main effects for emotion, $F(4,296) = 23.99$, $p < .0001$, and level $F(2,74) = 4.45$, $p < .0001$ and an interaction for emotion x sex, $F(4,296) = 7.66$, $p < .0001$.

Scheffe tests indicated that the emotions happy ($M = .83$) and sad ($M = .80$) were easier for children to identify than angry,($M = .65$) scared ($M = .67$) or loving ($M = .42$). Loving was the most difficult to correctly identify.

Accuracy also increased with developmental level; children in level D ($M = .73$) were more accurate in labelling emotions than children in level C ($M = .68$) and level B ($M = .62$).

Girls were more accurate at identifying the emotion loving than boys, while boys were more accurate at identifying the emotion happy (See Table 2).

CONCLUSIONS

The present findings provide empirical support for the hypotheses guiding this research. The use of multiple emotions, varying intensity of emotion, and different valence emotions seems to follow a systematic, developmental order of acquisition. Four levels of the sequence were proposed wherein children respond to a given hypothetical situation with: Level A - one emotion, varying intensity; Level B - two (or more) emotions of the same intensity and valence; Level C - two (or more) emotions of varying intensity but the same valence; Level D - two (or more) emotions with varying intensity, and including one of opposite valence. Evidence is also provided for age-related increases in use of multiple emotions.

The sequence described in this study is consistent with Piagetian and neo-Piagetian theories of cognitive development (Case, 1985; Fisher, 1980). Furthermore, the results for the older subjects in this study are consistent with the previous findings of Wintre et al. (1990) which revealed that children as young as 7 and 8-years-old responded to similar situations with up to three emotions of varying intensity of experience and opposite valence of emotions. The present results also support the prediction that children employ taxonomies similar to those of adults i.e., along the dimension of pleasantness (Russell & Ridgeway, 1983), and that emotional states tend to interrelate (Storm & Storm, 1987).

A second feature the design addresses is the accuracy with which children identify emotions. Although some emotions such as happy and sad were easier to identify than others, in general accuracy increased with development. These results are congruent with those of Brody and Harrison (1987). The finding that females were more accurate than males at identifying the emotion "loving" may be understood within Gilligan's (1982) framework. It postulates that females are engaged in different socializing experiences which, in comparison to those of males, emphasize interpersonal

relations. This point raises the issue that cognition is not solely responsible for emotional development. The contribution of differences in personality and socialization among children to developmental change and individual variation in the understanding of emotion should also be considered.

The present findings advance our knowledge of the development of emotion. They provide an alternative, developmental sequence of the acquisition of emotional response patterns that is empirical, scalable, and focuses on the previously relatively ignored concept of varying intensity of multiple emotions. As well, the design possesses greater sensitivity to useful discriminations between children at younger ages than previously possible. Ultimately, after normative testing, this apparatus, design, and scale could provide a practical diagnostic and research/evaluation tool for preschoolers and elementary grade children. There are potentially two dimensions for comparison - developmental level and accuracy.

Table 1

Developmental progression of the use of multiple emotions, varying intensity and opposite valence

Developmental Level	Abilities Demonstrated			Age (in months)		
	Multiple Emotions	Varying Intensity	Opposite Valence	N	M	SD
0	-	-	-	0	-	-
1	+	-	-	20	59	5.8
2	+	+	-	30	78	13.4
3	+	+	+	30	93	11.7

Note:
The criteria for passing each level are indicated across the top, whereas the developmental levels are shown down the left hand side. A plus sign denotes that the children demonstrated the ability to employ the specified criteria. A minus sign indicates that the children did not provide an example which fulfilled the criteria for any of the 15 emotionally-laden situations.

Table 2

Mean Accuracy Scores for the Emotion x Sex Interaction

	SEX			
	Male		Female	
	M	SD	M	SD
EMOTION				
Happy	.91	.27	.77	.27
Sad	.76	.27	.83	.23
Angry	.73	.31	.60	.29
Scared	.60	.27	.71	.28
Loving	.26	.31	.54	.38

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